

Commercial Buildings Energy Consumption Survey Briefing

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Outline of Briefing

- CBECS Overview
- CBECS & EISA
 - Defining a “similar building”
- Questions & Discussion



What is CBECS?

The *Commercial Buildings Energy Consumption Survey*...

- The only national-level source of data on the characteristics and energy use of commercial buildings
- Frequency: Every 3 to 4 years since 1979
- Sample size: 5,000 to 7,000 buildings nationwide
- Authority: Department of Energy (DOE) Organization Act of 1977, Public Law 95-91
- Confidentiality: All data are collected under the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA)

What is a Commercial Building?

- Target population: Any building that is not residential, not agricultural, and not manufacturing
- Excluded from CBECS:
 - Buildings less than 1,000 square feet
 - Parking garages
 - Buildings on military bases
 - Other restricted-access buildings
 - Buildings on manufacturing facilities

CBECS Sample

- Multistage area probability sample...
 - Statistically select from increasingly smaller geographic areas
 - “Field listers” canvass selected areas and list every commercial building within them
 - CBECS area sample is selected from that list
- ...supplemented with several list samples
 - Use several special lists in order to efficiently sample enough large buildings
 - Federal buildings, colleges/universities, hospitals, airports, and other large buildings

CBECS Data Collection: Two Phase Process

- Phase I: Buildings Survey
 - Mode: In-person computerized survey interview
 - Length: 30-45 minutes
 - Questionnaire content:
 - Building size, age, and structural characteristics
 - Building activity
 - Occupancy
 - Operating hours
 - Employees
 - Energy sources and uses
 - Energy-related equipment (heating, cooling, lighting, refrigeration, computers...)
 - Energy use and cost data for one year for electricity, natural gas, fuel oil, and/or district steam
 - Participation: Voluntary

CBECS Data Collection: Two Phase Process

- Phase II: Energy Suppliers Survey
 - Mode: Mail survey, initiated only for buildings where the respondent could not self-report their energy use data (~50% of buildings)
 - Respondents: Energy suppliers (electricity, natural gas, fuel oil, and district heat)
 - Participation: Mandatory

2007 CBECS

The **2007 CBECS** is being conducted right now

- Interviewing began in February, 2008 and should finish by the beginning of September
- Data are being collected by the National Opinion Research Center (NORC) of the University of Chicago

Energy Independence and Security Act of 2007

The inclusion of CBECS in EISA was news to us

From Title IV—Energy Savings in Buildings and Industry, Subtitle C—High-Performance Federal Buildings, Sec. 433—Federal Building Energy Efficiency Performance Standards.

“(D) Not later than 1 year after the date of enactment of the Energy Independence and Security Act of 2007, the Secretary shall establish, by rule, revised Federal building energy efficiency performance standards that require that:

“(i) For new Federal buildings and Federal buildings undergoing major renovations, with respect to which the Administrator of General Services is required to transmit a prospectus to Congress under section 3307 of title 40, United States Code, in the case of public buildings (as defined in section 3301 of title 40, United States Code), or of at least \$2,500,000 in costs adjusted annually for inflation for other buildings:

*“(I) The buildings shall be designed so that the fossil fuel-generated energy consumption of the buildings is reduced, as compared with such energy consumption by a similar building in fiscal year 2003 (as measured by **Commercial Building Energy Consumption Survey** or Residential Energy Consumption Survey data from the Energy Information Agency), by the percentage specified in the following table:*

<i>Fiscal Year</i>	<i>Percentage Reduction</i>
2010	55
2015	65
2020	80
2025	90
2030	100

CBECS & EISA

So, how might one define “...*a similar building in fiscal year 2003 (as measured by Commercial Building Energy Consumption Survey...*” ?

- CBECS Data Tables?
- EPA’s Target Finder?
- CBECS Public Use Microdata?

CBECS Home Page

www.eia.doe.gov/emeu/cbecs

Energy Information Administration - Commercial Energy Consumption Survey - Windows Internet Explorer

<http://www.eia.doe.gov/emeu/cbecs/>

Google

Energy Information Administration - Commercial Energy...

EIA Energy Information Administration
Official Energy Statistics from the U.S. Government

[Home](#) > [Households, Buildings & Industry](#) > [Commercial Buildings Energy Consumption Survey \(CBECS\)](#)

Commercial Buildings Energy Consumption Survey commercial energy uses and costs

[Glossary](#)

2007 CBECS Status Report

The 2007 Commercial Building Energy Consumption Survey (CBECS) is currently in progress. Interviewers from the National Opinion Research Center (NORC) are conducting in-person interviews across the U.S. on behalf of EIA. If your building has been selected, we urge you to participate. This is your opportunity to be included in the only comprehensive source of energy use and related characteristics of commercial buildings in the U.S. Your cooperation will increase the quality of a dataset that will be an integral input into energy research and the formulation of energy policy.

Projected release dates of data and preliminary data tables will be posted here.

The Commercial Buildings Energy Consumption Survey (CBECS) is a national sample survey that collects information on the stock of U.S. commercial buildings, their energy-related building characteristics, and their energy consumption and expenditures. Commercial buildings include all buildings in which at least half of the floorspace is used for a purpose that is not residential, industrial, or agricultural, so they include building types that might not traditionally be considered "commercial," such as schools, correctional institutions, and buildings used for religious worship.

The CBECS was first conducted in 1979; the eighth, and most recent survey, was conducted in 2003. CBECS is currently conducted on a quadrennial basis.

Data Tables
[Building Characteristics 2003 1999 1995](#)
[Consumption & Expenditures 2003 1999 1995](#)
[previous years 1992](#)

Public Use Microdata 2003 1999 1995 1992

Methodology
[Survey Methods 2003 1999 1995](#)
[Building Types Definitions](#)
[Data Collection Forms](#)

Survey Background & Technical Information
[Comparison Between Years](#)
[Glossary](#)

Census Map
[US Climate Zones](#)

Special Topics
[2003 Building Characteristics Overview](#)
[1999 Preliminary End Use Estimates](#)
[A Look at Principal Building Activities](#)
[1999 Building Characteristics Overview](#)

Potential
pages of
interest



CBECS Data Table

Table C10A. Consumption and Gross Energy Intensity by Climate Zone^a for All Buildings, 2003

	Sum of Major Fuel Consumption (trillion Btu)					Total Floorspace of Buildings (million square feet)					Energy Intensity for Sum of Major Fuels (thousand Btu/square foot)				
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
All Buildings	1,086	1,929	1,243	1,386	879	11,529	18,808	12,503	17,630	11,189	94.2	102.6	99.4	78.6	78.6
Principal Building Activity															
Education	141	238	131	186	123	1,537	2,800	1,403	2,435	1,698	91.6	85.2	93.5	76.6	72.6
Food Sales	Q	Q	Q	Q	Q	271	368	Q	273	Q	Q	Q	Q	Q	Q
Food Service	52	96	Q	134	Q	227	400	219	440	366	230.1	238.7	Q	305.4	Q
Health Care	96	161	108	145	83	475	784	564	844	496	202.4	205.8	191.4	171.9	167.7
Inpatient	65	127	Q	127	Q	262	450	323	592	278	246.1	283.3	Q	215.0	Q
Outpatient	Q	34	Q	Q	Q	213	334	240	252	218	Q	101.5	Q	Q	Q
Lodging	69	174	110	104	Q	768	1,314	1,132	1,275	608	90.1	132.1	Q	81.4	Q
Mercantile	169	232	163	247	210	1,617	2,337	1,694	3,346	2,197	104.7	99.2	96.3	73.8	95.7
Retail (Other Than Mall)	73	64	54	74	55	710	865	695	1,454	592	103.0	73.5	77.7	50.7	92.0
Enclosed and Strip Malls	96	168	109	173	156	907	1,473	Q	1,892	1,604	106.1	114.3	109.3	91.5	97.0
Office	145	364	298	162	165	1,593	3,165	3,125	2,341	1,985	90.7	114.9	95.4	69.3	83.2
Public Assembly	90	74	70	101	35	876	818	806	910	529	102.2	90.8	Q	111.1	65.8
Public Order and Safety	Q	Q	Q	Q	Q	Q	360	Q	Q	Q	Q	Q	Q	Q	Q
Religious Worship	26	62	26	31	19	408	1,320	499	1,039	488	62.9	46.9	52.8	29.4	38.2
Service	95	84	64	49	Q	944	1,185	644	969	308	100.4	71.2	99.5	50.3	Q
Warehouse and Storage	78	201	73	73	31	1,704	2,639	1,479	2,419	1,836	45.7	76.1	49.5	30.1	16.9
Other	Q	Q	Q	Q	Q	334	467	Q	Q	Q	Q	Q	Q	Q	Q
Vacant	Q	Q	Q	Q	Q	543	849	Q	569	318	Q	Q	Q	Q	Q

Example on next slide: 50,000 square foot office building in DC

Example

50,000 square feet x 94.5 kBtu per square foot (per year)
= 4,725,000 kBtu average per year for this size office
building in DC

Warning: Because CBECS is a sample survey, there is error associated with every point estimate.

The 95 percent confidence interval for this value is:
73.5 kBtu/sq ft to 117.3 kBtu/sq ft

Fossil Fuel-Generated Energy?

- CBECS breaks down total energy consumption into electricity, natural gas, fuel oil, and district heat
 - But, we don't have any information on the primary energy sources used to generate the electricity – would have to make assumptions
- Does EPA's Target Finder already make some of these assumptions?

CBECS Public Use Microdata

- “Raw” data files available online in CSV (comma separated value) files
- Allow deeper analysis than the two-way published data tables allow
 - But beware of quickly thinning sample sizes
- Smallest level of geography available is Census division

Questions & Discussion

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